

Korakot Chanjirakul 2010: The Amount of Fatty Acid, Antioxidant and Related Enzymes to Internal Browning in Pineapples (*Ananas comosus* (L) Merr.). Doctor of Philosophy (Horticulture), Major Field: Horticulture, Department of Horticulture. Thesis Advisor: Professor Jingtair Siriphanich, Ph.D. 127 pages.

'Trad Si Thong' and 'Pattavia' pineapples of two maturity stages were stored at 10 °C for 21 days. 'Trad Si Thong' pineapple showed earlier and more severe internal browning symptom than 'Pattavia'. 'Trad Si Thong' pineapples exhibited slightly higher electrolyte leakage, an indicator of membrane deterioration, than 'Pattavia'. The leakage increased gradually during storage. The PPO and POD activity of 'Trad Si Thong' pineapples increased quickly and higher than those found in 'Pattavia'. These data suggested that the severity of internal browning development in pineapple was due to the degree of membrane deterioration and the level of the enzyme activities, while the speed of internal browning development was mainly due to the degree of membrane deterioration. 'Trad Si Thong' pineapples had less total antioxidant capacity than 'Pattavia' by half. In addition, 'Trad Si Thong' contained less free radical scavenger capacity for singlet oxygen and superoxide, but not for hydroxyl radical. Asa-POD activity in 'Trad Si Thong' was also higher than 'Pattavia'. Thus, 'Trad Si Thong' had inferior antioxidant system to 'Pattavia'. Moreover, 'Trad Si Thong' exhibited higher content of unsaturated fatty acid, which is the target of free radical. MDA content that was the indicator of membrane damage by free radicals was also found higher in 'Trad Si Thong'. All these data illustrated that the internal browning that abound more in 'Trad Si Thong' because it had a weaker membrane and inferior total antioxidant system to 'Pattavia', resulting in more damaged membrane, electrolyte leakage and MDA content. In addition, the PPO and POD activities in 'Trad Si Thong' were activated higher than that in 'Pattavia' consequently more symptom was found in 'Tras Si Thong'. However, the relationship between membrane deterioration and browning enzyme activities remain unclear.

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Thesis Advisor's signature